Family Malacosteidae

Body elongate, deepest at head and tapering backward. Snout extremely short. Eye very large. Mouth enormous, ends of jaws extending beyond bases of pectoral fins and jaws not connected with sides of head back of orbit. Lateral edges of upper jaw formed by premaxillaries only. Teeth pointed, unequal, in jaws, none on palate. One or no barbel, but cylindrical muscular band connects symphysis of very thin lower jaw with front of hyoid bone. 20 gill rakers. Body scaleless. Dorsal and anal fins alike, far back, opposite. No adipose fin. Tail diphycercal,

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LOGAN SQUARE
PHILADELPHIA, PA.

caudal small and emarginate. Pectoral rudimentary. Ventral slender.

Analysis of Genera

a.' Small luminous organ below anterior part of eye in males only; no barbel; no pectoral fin. Photostomias.

a.² A large suborbital luminous organ; pectoral fin present.

b.' Barbel present. Aristostomias.

b.² No barbel. Malacosteus.

Genus Photostomias Collett

Photostomias Collett, Bull. Soc. Zool. France, vol. 14, 1889, p. 291. Type Photostomias guerni Collett, monotypic.

Thaumastomias Alcock, Ann. Mag. Nat. Hist., series 6, vol. 6, 1890, p. 220. Type Thaumastomias atrox Alcock, monotypic.

Mouth short.

Fangs fixed, slender, curved, pointed; about 10 in premaxillary of which second may be enlarged; 2 long lower front pairs followed on each side by series (to 25) of smaller uneven teeth; maxillary with series (to 30) of small oblique teeth. Vomer toothless. Series of small

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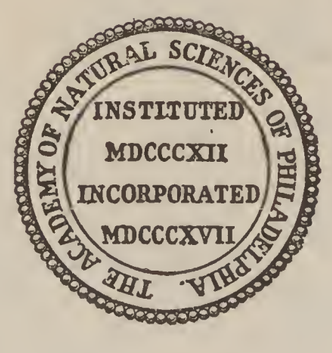

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LOGAN SQUARE,

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teeth on each palatine, increasing in size backwards; 5 to 7 pairs of teeth in 3 groups on basibranchials; teeth on gill arches fairly small. No barbel. Postocular luminous organ; rounded suborbital organ below front eye edge in adult males. Serial photophores approximately equidistant, except 2 subcontiguous organs on each side at end of series on isthmus; series on branchiostegal membrane. Dorsal and anal subequal, with thin, colorless fin membranes. Pectoral

present. Ventral with 6 rays, long and slender, reaching middle of anal.

Apparently a single species as no distinctive characters have been established for P. hotoxtomias atrox Alcock from the Indian Ocean.

Photostomias guerni Collett

Photostomias guerni Collett, Bull. Soc. Zool. France, vol. 14, 1889, p. 291. N. 38°34' 30" W. 30°43'30", 1138 meters, off Azores. Photostomias guernei Lütken, Kon. Dansk. Videnskb. Selsk. Skrift. Köbenhavn, ser. 6, vol. 7, 1892, p. 280, fig. (Atlantic). — Goode and Bean, Oceanic Ichth., 1895, p. 115, pl. 37, fig. 140 (compiled). — Collett, Rés. Camp. Sci. Monaco, vol. 10, 1896, p. 131, pl. 1, fig. 5 (type). — Zugmayer, Rés. Camp. Sci. Monaco, vol. 35, 1911, p. 65, pl. 3, figs. 1 — 1a (N. 31°39' to N. 35°40'30" W. 42°50' to W. 42°44'30", 3465 meters). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2,

December 30, 1927, p. 102, text fig. 13 (N. 20° to 32° W. 64° to 77°, 4000 to 10000 feet). — Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p. 134, pl. 13, fig. 1, ~~text fig. 130~~ (N. 12° to 38° W. 7° to 84°, 50 to 5000 meters). — Norman, Discovery Rep., vol. 2, 1930, p. 317 (S. 00° 56' W. 14° 8' 30", 250 meters; N. 13° 25' W. 18° 22', 900 meters; N. 6° 55' W. 15° 54', 800 meters).

Photonectes guernei Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p. 136, fig. 130 — 131.

1414

Photostomias atrox Alcock

Thaumastomias atrox Alcock, Ann. Mag. Nat. Hist., series 6, vol. 6, 1890, p. 220, pl. 8, fig. 7. N. 18°26' E. 85°24', 1310 fathoms, off Madras coast. — Goode and Bean, Oceanic Ichth., 1895, p. 115 (compiled).

→

↑ — Alcock, Journ. Asiatic Soc. Bengal, vol. 65, pt. 2, 1896, p. 334 (reference).

(copied).

Photostomias atrox Alcock, Cat. Deep Sea Fishes Indian Mus., 1899, p. 150

(Bay of Bengal and off Andamans, 606 to 1310 fathoms; remarks on Goode and Bean's incorrectly copied figure);

Illustrat. Zoology Investigator, Fishes, pt. 7, 1900, pl. 30, fig. 2 (type). — Regan

1414

Photostomias atrox Alcock

Thaumastomias atrox Alcock, Ann. Mag. Nat. Hist., series 6, vol. 6, 1890, p. 220, pl. 8, fig. 7. N. 18°26' E. 85°24'; 1310 fathoms, off Madras coast. — Goode and Bean, Oceanic Ichth., 1895, p. 115 (compiled).

→ Thaumatostomias atrox Goode and Bean, Oceanic Ichth., 1895, pl. 37, fig. 141 (copied).

Photostomias atrox Alcock, Cat. Deep Sea Fishes Indian Mus., 1899, p. 150 (Bay of Bengal and off Andamans, 606 to 1310 fathoms; remarks on Goode and Bean's incorrectly copied figure);

Illustrat. Zoology Investigator, Fishes, pt. 7, 1900, pl. 30, fig. 2 (type). — Regan

and Irewavas, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p. 137 (type).

Photostomias guernei (not Collett 1889) Collett, Rés. Camp. Sci. Monaco, vol. 10, 1896, p. 131 (part).

Photostomias guerni Collett

Photostomias guerni Collett, Bull. Soc. Zool. France, vol. 14, 1889, p. 291. N. Lat. 38° 34' 30" W. Long. 30° 43' 30", in 1138 meters (off Azores).

Photostomias guernei Goode and Bean, Oceanic Ichth., 1895, p. 115, pl. 37, fig. 140 (compiled). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, December 30, 1927, p. 102 (text fig. 13 p. 12) (Atlantic materials).

Thaumastomias atrox Alcock, Ann. Mag. Nat. Hist., series 6, vol. 6, 1890, p. 220, pl. 8, fig. 7. — Goode and Bean, Oceanic Ichth., 1895, p. 115 (reference). — Alcock, Journ.

Depth 6 3/4 to 7; head 4 3/5 to 4 3/4, width 2 to 3. Snout 5 1/2 to 5 4/5 in head from snout tip; eye 5 1/4 to 6, greater than snout, 1 1/4 to 1 3/5 in interorbital; maxillary extends 3 1/4 to 3 1/2 eye diameters behind eye, length but slightly less than head; 7 to 9 rather large pre maxillary teeth each side, of mandibulars usually 2 pairs enlarged anteriorly; interorbital 3 1/3 to 3 3/5 in head from snout tip, convex. No gill rakers; gill filaments about half of eye.

Narrowly triangular postorbital luminous organ 1/2 of eye. Innumite

photophores on body inconspicuous;
lateral series 15 or 16 between
pectoral and ventral, 17 between
ventral and anal, then 17 to caudal;
lower or ventral series 10 branchiostegals,
9 on isthmus, then 15 to ventrals, 19
between ventral and anal, 13 along
anal base.

D. 23, fin height 2 1/8 to 2 1/2
in total head; A. 24 to 26, fin height
2 1/5; caudal 2 1/5, forked, slender
lobes pointed; ventral 2 2/5 in
combined head and body to caudal
base; least depth of caudal
peduncle 1 to 1 1/3 in eye.

1422

Largely blackish or dark brown.
Head paler. Iris neutral gray.
Fins whitish.

83837 U.S.N.M.

Albatross Station 2393.

Length 59 mm.

91401 U.S.N.M.

Sw 1650 meters. Albatross Station 20024. November 22, 1919. Length 68 mm.

Genus Aristostomias Zugmayer

Aristostomias Zugmayer, Bull. Inst. Océanogr. Monaco, No. 253, 1913, p. 1.

Type Aristostomias grimaldii Zugmayer.

Zastomias Gilbert, Proc. U. S. Nat. Mus., vol. 48, 1915, p. 322. Type Zastomias scintillans Gilbert, orthotypic.

Mouth cleft straight. Fangs fixed, curved, strongly barbed. Premaxillaries with 6 or 7 fangs each side, not enlarged. Lower jaw with 2 pairs of long anterior fangs, fitting into grooves on snout, followed each side by 5 to 9 smaller fangs. Vomer

toothless. Long series (to 12) of teeth on each palatine; 1 to 3 pairs of teeth on first basibranchial, 2 to 4 pairs on second, none on gill arches. Crescentic suborbital luminous organ close to lower front border of orbit; above its hind end small double organ and behind postocular luminous organ. Barbel slender, usually ending in small swelling. Dorsal photophores show tendency to form small linear or clustered groups; 3 pairs before pectoral always lying between right

and left members of 2 preceding pairs. Dorsal and anal begin at same vertical, bases fleshy, rays partly covered by thick black membrane. Paired fins small; pectoral rays fine, 6 to 17; ventral 6, median or postmedian.

The following nominal form is without sufficient details of its photophores or luminous organs:

Aristostomias uncodentatus Borodin

Aristostomias uncodentatus Borodin, Proc. New England Zool. Club, vol. 11, Jan. 10, 1930, p. 90. N. 33° W. 64°, 1200 meters.

= Callechelys

Caecula melanotaenia (Bleeker)

Callechelys melanotaenia Bleeker, Nederl. Tijdschr. Dierk., vol. 2, 1865, p. 213. (Amboina); Atlas Ichth. Ind. Néerl., vol. 4, 1864, p. 66, pl. (49) 193, fig. 2 (type).

Ophichthys melanotaenia Günther, Cat. Fishes Brit. Mus., vol. 8, 1870, p. 87 (type).

Analysis of species

a. Ventral photophores more or less divided by gaps, but without groups of close set photophores; pectoral rays 4 to 8.

b. Lateral photophores between gill opening and ventral without group of close set photophores; barbel of adult without distinct bulb; curved strip of luminous tissue in front of and below eye and suborcular organ. lumifer.

d.² distance between anal origin and vent 1/4 or less in head; pectoral 4 to over 5 in head. floresiana

c.² distance of dorsal origin from anal origin more than half head length.

f.' Eye 2 in snout. lineatus.

f.² Eye nearly long as snout. ocularis.

b.² distance between vent and anal origin more than head length. bicolor.

a.² Ophthalmi

b.² Lateral photophores between gill opening and ventral with group of close set photophores posteriorly; barbel with ovate or club shaped bulb.

scintillans.

a.² Ventral photophores between pectoral and ventral divided into linear or clustered groups of close set photophores; those between gill opening and ventral similar except first 3 or 4 photophores, which spaced.

c.' Pectoral rays 6 to 10; postocular luminous organ much shorter than eye.

d.' Ventral photophores 14 to 18 between gill opening and ventral; postocular organ ¼ Eye or less; no series of luminous dots on head; barbel with small bulb which broader basally.

xenostoma.

d.² Ventral photophores 18 to 20 between gill opening and ventral; postocular

~~luminous~~ organ 1/2 to 2/3 eye; series of luminous dots running backwards from between suborbular and postocular organs; barbel with conspicuous oval or club-shaped bulb. tittmanni.

d.[2] Ventral photophores 16 between gill opening and ventral; postocular organ 1/4 to 3/5 eye; series of luminous dots as in tittmanni; barbel with long slightly thickened part. grimaldii.

c.[2] Pectoral rays 14 to 17; postocular luminous organ about long as eye. polydactylus.

Aristostomias grimaldii Zugmayer

Aristostomias grimaldii Zugmayer,

Bull. Inst. Océanogr. Monaco, No. 253,

1913, p. 1.

— Regan and Trewavas, Danish Dana

Exped. Oceanogr. Rep., No. 6, March 10, 1930,

p. 141, pl. 14, fig. 2 (type; N. 5° to 35° W.

51° to 82°, 50 to 1500 meters).

Depth 4 3/3 to 6; head 3 2/5 to 4. Snout

3 2/5 to 4 1/2; eye 5 to 6; barbel 1/3 to 3/5 of

fish, ends in slight elongate swelling,

often curved, probably luminous only

at terminal end.

Suborbital luminous organ 2/3

to nearly long as eye; postocular

1/4 to 3/5 of eye; series of small bluish luminous spots running backward from between suborbital and postocular organs; group of similar spots below suborbital organ and sometimes before eye. Lateral photophores 16 between gill opening and ventral, first 4 oblique, rest in 4 close linear groups of 2 to 4; 15 or 16 between ventral and anal, 1 or 2 close groups of 3 to 4 at beginning, generally 1 at end, rest spaced. Ventral series 5 + 3 between isthmus and pectoral, 14 to 16 between pectoral and ventral, in 5 close groups of 2 to 4, some clustered, 15 to 17 between ventral and anal in close linear groups of 1 to 4 or 3 to 7 in middle spaced, 10 or 11 between anal and caudal.

D. 21 to 26; A. 27 to 32; pectoral 7 to 10; ventral 6; midway from snout tip or front eye edge and caudal base.

Length 117 mm. without caudal.

(Regan and Trewavas.)

Atlantic Ocean, Caribbean Sea.

Aristostomias lunifer Regan and Trewavas

Aristostomias lunifer Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., no. 6, March 10, 1930, p. 138, pl. 13, fig. 2, text fig. 132 (end of barbel). N. 19°1' W. 65° 23', 600 meters, north of Virgin Islands; N. 35°42' W. 73°43', 300 meters, N. 35°42' W. 73°43', 300 meters.

?Aristostomias scintillans (not Gilbert) Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 2, Dec. 30, 1927, p. 96, fig. 54 (N. 23°39' W. 76°41', 7000 feet; N. 32°19' W. 64° 33', 8000 feet).

Depth 6½ to 7; depth 4 to 4⅔. Snout 3½ in head; eye 5 to 5½; barbel ⅓ to ⅗ fish, end luminous, hardly enlarged.

1433

Suboocular luminous organ 1/2 to 2/3 eye; postocular organ 1/3 to 1/2; semicircular strip of luminous tissue before and below eye and suboocular organ. Lateral photophores 18 or 19, between gill opening and ventral, sometimes gap after fourth, no close set groups but last 2 sometimes closer together than rest; 16 to 18 between ventral and anal, last 4 to 7 forming close group. Ventral series 5 + 3 between isthmus and pectoral, 17 or 18 between pectoral and ventral divided into groups by gaps after sixth, ninth and tenth and sometimes thirteenth or fourteenth but none of groups with photophores close set; 13 or 14 between ventral and anal with gaps after third and seventh; 10 or 11 between anal and caudal, last 3 or 4 forming close group.

D. 20 to 24; A. 26 to 29; pectoral 7 or 8; ventral 6, median or nearer caudal.

Length 93 mm. without caudal.

(Regan and Trewavas.)

Western Atlantic, Caribbean Sea.

Aristostomias polydactylus Regan and Trewavas

Aristostomias polydactylus Regan and Trewavas, Danish dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p. 141, pl. 14, fig. 3, text fig. 137. N. 17° to 25° W. 45° to 82°, 50 to 927 meters, Western Atlantic and Caribbean Sea.

Depth 5 to 7; head 3 to 3 3/4. Snout 3 to 3 3/4 in head; eye 5 to 7; barbel 2/5 to nearly 3/4 of fish, ending in narrow elongate bulb.

Suborular luminous organ long as eye; numerous small greenish spots below and before eye, dense streak between suborular and postocular organs and trail of spots backwards. Lateral photophores 15 to 17 between gill opening and ventral, first 3 or 4 ascending obliquely, these and next 2 to 5 spaced, rest in close linear groups of 2 to 4; 17 or 18 between ventral and anal, first 3 or 4 close, rest spaced

except sometimes last 2 or 3. Ventral series 5 + 3 between isthmus and pectoral; 15 to 17 between pectoral and ventral, in 6 or 7 groups of 1 to 4; 15 to 18 between ventral and anal, all spaced, or first 2 or 3 or first and last 3 in close group.

D. 21 to 26; A. 26 to 29; pectoral 14 to 17; ventral 6, nearly median. Length 60 mm. without caudal. (Regan and Trewavas.)

Atlantic; Caribbean Sea.

1436

Aristostomias scintillans (Gilbert)

Zaristomias scintillans Gilbert, Proc.
U. S. Nat. Mus., vol. 48, 1915, p. 322, pl. 15,
fig. 4. Monterey Bay, California, 389 & 551
fathoms.

? Aristostomias scintillans Parr, Bull.
Bingham Oceanogr. Collection, vol. 3, art.
2, 1927, p. 96, fig. 11 (part;). — Regan
and Trewavas, Danish Dana Exped.
Oceanogr. Rep., No. 6, March 10, 1930, p.
138 (note).

type; N. 23°39' W. 76°41'; 7000 feet

Depth 5 1/2; head 3 7/8, width 3.
Snout 4 in head; eye 5, 1 1/2 in snout,
1 3/5 in interorbital; maxillary extends
3 eye diameters behind eye, length

1 1/10 in head; pair of canines outside premaxillaries, when mouth closes in deeper grooves or sockets beneath posterior nostrils; posteriorly 5 pairs of shorter canines of about equal length; maxillary with minute retrorse teeth; mandible with pair of strong front canines, when mouth closes lie in shallow grooves in front surface of snout and upper jaw; palatine teeth small, uniserial; barbel inserted below eye, half combined head and body to caudal base, reaches beyond ventral base, with smooth clavate terminus; interorbital 4 2/3 in head,

convex. No gill rakers; gill filaments 1 1/2 in eye.

Head, body and fins with numerous, minute luminous bodies, many arranged in vertical intersegmental lines. Narrow curved luminous body on infraorbital and another larger and ovoid below and behind eye. Lateral row of photophores low, with occasional groups of 4 or 5 closely crowded spots, widely spaced; ventral series low, not made out.

D. 21, fin height 2 7/8.? in head; A. 27, fin height 3.?; caudal 1 2/5, damaged, forked.?; pectoral 1 4/5 in

head, rays 1+3, all free filaments; ventral 1/4/5, rays 4 to 6; least depth of caudal peduncle 1'/3 in eye.

Blackish brown, light brown on areas where skin torn away. Iris neutral dusky. Fins largely whitish, dorsal and anal with dark brown anteriorly.

Pacific Ocean.

75808 U.S.N.M.

Monterey Bay, California. Albatross Station 4540. Length 72 mm. Type of Zastomias scintillans.

Blackish brown, light brown on areas where skin torn away. Iris neutral dusky. Fins largely whitish, dorsal and anal with dark brown anteriorly.

Pacific Ocean.

75803 U.S.N.M. Monterey Bay, California. Albatross Station 4540. Length 72 mm. Type of Eastomias scintillans.

Aristostomias titt anni Welsh

Aristostomias tittmanni WELSH, Proc. U.S.Nat. Mus., vol.62, art.3, 1923, p.3, fig.2. From 115 miles east of Cape Hatteras, 100 meters. - REGAN and TRE-WAVAS, Danish Dana Exped. Oceanogr. Rep., No.6, March 10, 1930, p.140, figs. 135 and 136 (N. 8° to 37° W. 25° to 83°, 40 to 2000 meters).

Depth 6 1/2; head 3 1/5, width 4. Snout 3 1/4 in head; eye 5 1/2, 1 2/3 in snout, 1 1/5 in interorbital; maxillary extends 2 3/4 eye diameters behind eye, length but slightly less than head; teeth unequal, upper with 2 pairs of long, hollow, terminally barbed canines, followed by 5 pairs of much smaller terminally recurved teeth, then 12 pairs of straight recumbent teeth; lower teeth with 2 pairs of large and 5 pairs of smaller blade like terminally barbed teeth, first 2 pairs fitting in grooves on side of snout where mouth closes; palatines with 4 small teeth each side; tongue with 2 groups of strong retrorse teeth; barbel inserted behind eye, 1 3/4 in combined head and body to caudal base, simple, filamentous, ends in smooth, ovoid knob; interorbital 4, convex. No gill rakers.

White ovoid luminous body in slit like socket close behind and below eye. Lateral photophores in 6 linear groups from pectoral to ventral, 4, 3, 3, 3, 3, 4, then group of 3 and 8 single more or less equidistant to vertical of anal

1440

Aristostomias tittmanni Welsh

Aristostomias tittmanni Welsh, Proc. U. S. Nat. Mus., vol. 62, art. 3, 1923, p. 3, fig. 2. From 115 miles east of Cape Hatteras, 100 meters. — Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p. 140, figs. 135 and 136 (N. 8° to 37° W. 25° to 83°, 40 to 2000 meters).

Depth 6 1/2; head 3 1/5, width 4. Snout 3 1/4 in head; eye 5 1/2, 1 2/3 in snout, 1 1/5 in interorbital; maxillary extends 2 3/4 eye diameters behind eye, length but slightly less than head; teeth unequal, upper with 2 pairs of

long, hollow, terminally barbed canines, followed by 5 pairs of much smaller terminally recurved teeth, then 12 pairs of straight recumbent teeth; lower teeth with 2 pairs of large and 5 pairs of smaller blade like terminally barbed teeth, first 2 pairs fitting in grooves on side of snout where mouth closes; palatines with 4 small teeth each side; tongue with 2 groups of strong retrorse teeth; barbel inserted behind eye, 1 3/4 in combined head and body to caudal base, simple, filamentous, ends in smooth, ovoid knob; interorbital 4, convex. No gill rakers.

White ovoid luminous body in slit like socket close behind and below eye. Lateral photophores in 6 linear groups from pectoral to ventral, 4, 3, 3, 3, 3, 4, then group of 3 and 8 single more or less equidistant to vertical of anal origin where row ends in group of 4; lower or ventral photophores with 6 clustered groups of 2 to 4 each from pectoral to ventral, then 5 linear groups of 2 to 4 each above anal origin, single row of 11 photophores over anal base to end of caudal peduncle.

D. 22, fin height 2 2/3 in head;

1443

84290 U.S.N.M. 115 miles east of
Cape Hatteras. Grampus (Backe
Station 10161. 3 in 100 meters.
January 28, 1914. Length 46 mm.
Type.

6503. Balibias Bay. July 17, 1908. (1032

Length 398 mm.

7447. Bolalo Bay. December 21, 1908.

Length 434 mm.

7815, 7839. Bugsuk Island. January 5, 1909.

Length 258 to 305 mm.

8808. Butuanan, Luzon. June 13, 1909.

Length 195 mm. Gray above becoming silvery or white below, margins of scales above palest. Back and upper side with numerous small orange spots about size of BB shot above, becoming smaller below lateral line and upon back in oblique rows upon scale rows. Same on top of head behind and below eye, fuse into horizontal stripes, 6 on cheek under eye, 2 lower obscure. Dorsal body gray, darker terminally and posteriorly, margin with orange;

Aristostomias xenostoma Regan and Trewavas

Aristostomias xenostoma Regan and Trewavas,
Danish Dana Exped. Oceanogr. Rep., no.
6, March 10, 1930, p. 139, pl. 13, fig. 3,
and 134.
text figs. 133, N. 8° to 17° W. 30° to 64°, 300
to 4000 meters, Western Atlantic and
Caribbean Sea. — Norman, Discovery
Rep., vol. 2, 1930, p. 317 (S. 3°6'30" W.
3°53', 102 meters).

* Depth 4 2/3 to 6; length 3 1/3 to 4 1/2.
Snout 2 2/3 to 4 in head; eye 3 1/2 to
4 2/5; barbel 1/10 to over 1/2 fish, ending
in small white bulb, broader basally
(adult) or terminally (young).

Suborbital luminous organ little

short or nearly long as eye, 4 to 7 times postocular organ (5 to 8 times in young); sometimes few bluish spots below suborbular organ. Lateral photophores 14 to 18 between gill opening and ventral, first 3 or 4 rising in obliquely, rest in groups of 2 to 4; 14 to 16 between ventral and anal, in groups except sometimes 3 to 6 spaced in middle of series (4 to 9 in young). Ventral series 5 + 3 between isthmus and pectoral; 14 to 17 between pectoral and ventral, in 5 or 6 groups of 2 to 4 close set spots; 15 to 18 between ventral and anal in similar groups; 9 to 11 between anal and caudal.

D. 21 to 23; A. 26 to 29; pectoral 6 to 9; ventral 6, median. Length 112 mm. without caudal. (Regan and Trewavas.)

Atlantic; Caribbean Sea.

Genus Malacosteus Ayres

Malacosteus Ayres, Boston Journ. Nat. Hist., vol. 6, Sep. 1849, p. 53. Type Malacosteus niger Ayres, monotypic.

Body compressed. Head rather compressed. Snout blunt, short. Eye far forward, at front end of snout. Mouth cleft extremely wide, jaw bones and preopercle greatly prolonged to form an enormous gape, ~~sufficiently large~~ f Premaxillary teeth small, fixed. Maxillary teeth minute, oblique, or absent. Lower jaw with 4 or 5 enlarged, fixed fangs, barbed at tips with smaller fixed teeth between and behind. Palate toothless; 10 to 12 pairs in 4 groups on basibranchials, rudimentary or absent on gill arches. No barbel. Gills 4. Gill filaments very short.

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LOGAN SQUARE
PHILADELPHIA, PA.

Branchiostegals 8, extremely short, rod like, cartilaginous. Large suborbular luminous organ below eye, pointed anteriorly; small double organ above its hind end postocular luminous organ well behind eye. No photophores on branchiostegal membrane and no serial photophores on body. Dorsal and anal origins opposite, with deep muscular bases and thick blackish fin membranes. Pectoral small, rays 3 to 5. Ventral rays 6, postmedian.

Analysis of species

a.' Postocular luminous organ over 1/4 of eye; suborbular luminous patch long as eye, more than twice long as deep.

b.' Head 3 3/4 to 3 4/5. *niger.*

b.² Head 3 1/2. *indicus.*

a.² Postocular luminous organ smaller, less than 1/4 of eye; depth of suborbular luminous patch 1/2 diameter of eye; head 3 2/5 to 3 2/3.

danae.

1448

Malacosteus niger Ayres

Malacosteus niger Ayres, Boston Journ. Nat. Hist., vol. 6, Sep. 1849, p. 54, pl. 5. West Atlantic in N. Lat. 42° W. Long. 50°. — Günther, Cat. Fishes Brit. Mus., vol. 5, 1864, p. 428 (compiled); Rep. Voy. Challenger, vol. 22, 1887, p. 214, pl. 54, fig. C (copied). — Goode and Bean, Oceanic Ichth., 1895, p. 114, pl. 37, fig. 138 (off Barbadoes, 347 fathoms; N. 37° to 39° W. 71° to 73°, 541 to 1064 fathoms). — Jordan and Evermann, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 593 (copied). — Zugmayer, Rés. Camp. Sci. Monaco, vol. 35, 1911, p. 68, pl. 3, fig. 2 (N. 37°10' W. 11°48', 4750 meters; N. 36°6'40" W. 10°18', 4740 meters). — Murray

and Hjort, Depths of the Ocean, 1912, p. 612 (N. 31° 20' W. 35° 7', 3886 meters, south of Azores). — Roule, Rés. Camp. Sci. Monaco, vol. 52, 1919, p. 26 (N. 37° 57' W. 27° 47' 45", 1748 meters). — Parr, Bull. Bingham Oceanogr. Collection, vol. 3, art. 3, Dec. 30, 1927, p. 99 (text fig. p. 11) (N. 21° to 32° W. 64° to 77°, 7000 to 10000 feet).

— Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., no. 6, March 10, 1930, p. 142, fig. 138 (N. 8° to 35° W. 7° to 70°, 1600 to 7000 meters). — Norman, Discovery Rep., vol. 2, 1930, p. 317 (S. 33° to N. 13° E. 4° to 16° to W. 21°, 625 to 2000 meters).

Malacosteus choristodactylus Vaillant, Exped. Sci. Travailleur et Talisman, Poiss., 1888, p. 108, pl. 8, fig. 4. Coast of Morocco and Azores, 1400 to 2220 meters.

— Murray and Hjort, Depths of the Ocean, 1912, p. 612 (Gran Canaria to Fayal, Azores, 1235 to 3886 meters).

Malacosteus indicus (not Günther)

Alcock, Ann. Mag. Nat. Hist., series 6, vol. 4, 1889, p. 452 (Andaman Sea, off Cinque Island, 650 fathoms). — Goode and Bean, Oceanic Ichth., 1895, p. 114 (reference). — Alcock, Journ. Asiatic Soc. Bengal, vol. 65, pt. 2, 1896, p. 334 (reference). — Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 5, Tiefsee-Fische, 1906, p. 65, text figs. 23–25 (luminous organ

— Murray and Hjort, Depths of the Ocean, 1912, p. 612 (Gran Canaria to Fayal, Azores, 1900 to 2500 meters). — Weber and

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Malacosteus indicus (not Günther)

Alcock, Ann. Mag. Nat. Hist., series 6, vol. 4, 1889, p. 452 (Andaman Sea, off Cinque Island, 650 fathoms). — Goode and Bean, Oceanic Ichth., 1895, p. 114 (reference). — Alcock, Journ. Asiatic Soc. Bengal, vol. 65, pt. 2, 1896, p. 334 (reference). — Brauer, Deutsch. Tiefsee Exped. Valdivia, vol. 5, Tiefsee-Fische, 1906, p. 65, text figs. 23–25 (luminous organ and head) (north of Cocos Island, Bay of Bengal, Chagos Island, West Africa, 1900 to 2500 meters). — Weber and

Beaufort, Fishes Indo Austral. Archipelago, vol. 2, 1913, p. 118, fig. 43 (compiled). — Gilchrist, Fisher. Marine Biolog. Surv. South Africa, Report No. 2, 1921 (1922), No. 3, p. 54 (off Cape Point, in 1014 fathoms). — Barnard, Ann. South African Mus., vol. 21, pt. 1, June 1925, p. 139, pl. 7, fig. 5 (compiled).

Malacosteus sp. Alcock, Cat. Deep Sea Fishes Indian Museum, 1899, p. 149 (Andaman Sea example); Illustrat. Zool. Investigator, pt. 7, 1900, pl. 33, fig. 4.

THE ACADEMY OF NATURAL SCIENCES
OF PHILADELPHIA

JAMES A. G. REHN
SECRETARY

LOGAN SQUARE
PHILADELPHIA, PA.

Depth 5 3/4 to 6; head 3 3/4 to 3 4/5, width 3 to 3 3/4. Snout 11 to 12 in head; eye 5 1/4 to 6, twice or more than snout as seen in profile, 1 2/5 to 1 1/2 in interorbital; maxillary extends 3 2/3 to 4 1/5 eye diameters behind eye, 1 1/8 in head; 3 pairs of short wide spaced upper canines with many shorter uniform uniserial teeth; 4 pairs of longer wide spaced lower canines with many shorter uniform uniserial teeth, second pair longest; interorbital 4 to 4 2/5, well convex. No gill rakers; gill filaments 1 2/3 in eye.

dvoid or crescentic luminous
body below and posterior to eye.
close above maxillary, and smaller
one little posterior. Photophores of
body very minute and inconspicuous.

D. 19, fin height 2 1/8 to 2 2/3
in head; A. 20, fin height 2 to 2 4/5;
caudal 3 1/8 to 4, small, deeply
emarginate; pectoral 1 1/2 to 2 3/4, rays
3 or 4; ventral 1 2/5 to 2 1/5?, rays 5;
least depth of caudal peduncle 1 3/4
in eye.

Uniform black. Luminous bodies
on cheek below and behind eye white.
Fins all black.

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Plate, Atlantic and Indian Oceans.

32169 U.S.N.M. Georges Bank. Schooner A. Wonson. Gloucester donation 797. Length 125 mm. In poor preservation.

35526 U.S.N.M. N. 39° 35' W. 71° 18'. In 1064 fathoms. Albatross Station ~~Collection~~ 2211. Length 100? mm.; specimen distorted.

39220 U.S.N.M. N. 37° 46' 30" W. 73° 56' 30". Albatross Station 2742. Length 160 mm.

44580 U.S.N.M. N. 39° 5' 30" W. 72° 23' 20". In 541 fathoms. Albatross Station 2584. Length 68? mm. Very poorly preserved.

89916 U.S.N.M. N. 35° 50' W. 63° 55'. Museum Comp. Zool. No. 11. Length 86 to 90 mm. 2 examples.

Caudal and anal bright rosy,
nearly scarlet, both lobes
tipped with real brown to
nearly black. Paired fins
paler rosy. Travel in schools,
a large number of about same
size killed at one shot. These
fish are dried by stringing, as
a grunion between 2 sticks.

Malacosteus indicus Günther

Malacosteus indicus Günther, Ann. Mag. Nat. Hist., series 5, vol. 2, 1878, p. 181. Pacific Ocean near Philippines, 500 fathoms; Rep. Voy. Challenger, vol. 22, 1887, p. 214, pl. 54, fig. B (type). — Regan and Trewavas, Danish Dana Exped. Oceanogr. Rep., No. 6, March 10, 1930, p. 143 (type).

Depth 7 1/2; head 3 1/2. Eye 5 in head. Depth of suborbital luminous patch 1/2 of eye. Postocular luminous organ more than 1/4 of eye.

D. 20; A. 20; pectoral 3; ventral 6, postmedian. Length 106 mm. without caudal. (Regan and Trewavas.)

Philippines.

Malacosteus danae Regan and Trewavas

Malacosteus danae Regan and Trewavas,
Danish Dana Exped. Oceanogr. Rep., No.
6, March 10, 1930, p. 143, pl. 14 fig. 1.
N. 7°30' W. 79°19'; 3500 meters; N. 7°15' W. 78°54';
3500 meters, Gulf of Panama.

Depth 7; head 3 2/5 to 3 2/3. Eye 5 in head.
Suborular luminous patch long as eye, more than twice long as deep. Postocular luminous organ 1/4 of eye.

D. 19 to 21; A. 20 to 22; pectoral 3 or 4; ventral 6, median. Length 146 mm. without caudal.

(Regan and Trewavas.)

(Gulf of Panama.

p. 33 (compiled). — Parr, Bull.
Brigham Oceanogr. Collection, vol. 2,
art. 4, Oct. 1931, p. 9 (note).

D. 24, fin height 3; caudal 2 1/3, lower lobe longer; pectoral 2 4/5, rays 3, 5 or 8, filamentous; ventral 1 4/5, rays 6; least depth of caudal peduncle 1 1/3 in eye.

Very dark sooty brown, almost black, finely sprinkled with minute white granulations. Suborbital luminous body yellow, postorbital white. Barbel white, with series of minute black dots, bulb and barbel tip yellowish. Dorsal and anal black basally. Caudal and pectoral whitish, ventral rays dotted with black.

Atlantic Ocean.